

WHAT IS CLAIMED IS:

1. A film-forming apparatus comprising:

a plate which is to be exposed to process gas and  
has an embedded heater that generates heat by  
5 resistance heating;

a terminal which is exposed at one surface of the  
plate and supplies power to the heater;

a first seal surface provided on the plate, shaped  
like a ring and surrounding the terminal;

10 a stem shaped like a hollow cylinder, surrounding  
the terminal and supporting the plate;

a second seal surface shaped like a ring and  
extending along that end of the stem which supports the  
plate;

15 a cover which closes an open end of the stem,  
which is opposite to the end which supports the plate;

a conductor passing through the cover into the  
stem and connected to the terminal;

20 a flow path provided in the cover and configured  
to supply inert gas into the stem.

2. The film-forming apparatus according to  
claim 1, further comprising a seal ring interposed  
between the first and second seal surfaces and having a  
higher resistance to heat conduction than the plate and  
25 stem.

3. The film-forming apparatus according to  
claim 2, further comprising a fastening member which

fastens the plate and the stem to each other and which penetrates the seal ring.

4. The film-forming apparatus according to claim 2, wherein an inner circumferential part and  
5 outer circumferential part of the seal ring contact the first and second seal surfaces, respectively.

5. The film-forming apparatus according to claim 2, wherein the seal ring is inserted in a recess made in at least one of the first and second seal  
10 surfaces, said recess being so shaped that one seal surface leaves from the other seal surface.

6. The film-forming apparatus according to claim 2, wherein the seal ring is made of alumina-based ceramic.

15 7. The film-forming apparatus according to claim 2, wherein the seal ring is made of magnesia-based ceramic.

8. The film-forming apparatus according to claim 3, wherein the fastening member is made of  
20 alumina-based ceramic.

9. The film-forming apparatus according to claim 1, wherein at least one of the first and second seal surfaces is formed convex, toward the other.

25 10. The film-forming apparatus according to claim 1, wherein at least one of the first and second seal surfaces is formed convex, bulging arcuate in cross section.

11. The film-forming apparatus according to claim 1, further comprising sheaths provided between the plate and the cover and surrounding the terminal and the conductor, and in which the inert gas is  
5 supplied into the sheaths from the flow path.

12. The film-forming apparatus according to claim 1, wherein the plate comprises a high-frequency ground electrode which is embedded in a side opposite to the terminal with respect to the heater.

10 13. The film-forming apparatus according to claim 1, wherein the plate comprises a temperature-detecting portion which detects a temperature of the heater.

14. The film-forming apparatus according to claim 1, further comprising:  
15

a high-frequency ground electrode embedded in the plate;

a terminal connected to the electrode and exposed at the same side as the terminal;

20 a high-frequency cable penetrating the cover and connected to the terminal that is connected to the electrode;

a sheath thermocouple penetrating the cover, inserted in the plate and configured to detect a  
25 temperature of the heater; and

sheaths which surround the terminal connected to the electrode, the high-frequency cable and the sheath

thermocouple, and into which the inert gas is supplied from the flow path, the terminal, high-frequency cable and sheath thermocouple being exposed between the plate and the cover.

- 5        15. The film-forming apparatus according to claim 1, wherein the inert gas is supplied at a pressure equal to or higher than a pressure of the process gas outside the stem.